PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P6358PC00:CLK:GP	**FOR FURTHER ACTION**	See Form PCT/IPEA/416
International application No. **PCT**/AU2005/000093	International filing date *(day/month/year)* 28 January 2005	Priority date *(day/month/year)* 30 January 2004
International Patent Classification (IPC) or national classification and IPC Int. Cl. ***A01C 23/04*** (2006.01)		
Applicant MACMAHON, John Fletcher		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. [X] *(sent to the applicant and to the International Bureau)* a total of **5** sheets, as follows:
      - [ ] sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      - [ ] sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

   b. [ ] *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or table related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

[X]	Box No. I	Basis of the report
[ ]	Box No. II	Priority
[ ]	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
[ ]	Box No. IV	Lack of unity of invention
[X]	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
[ ]	Box No. VI	Certain documents cited
[ ]	Box No. VII	Certain defects in the international application
[ ]	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
25 November 2005	19 December 2005
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer **ADRIANO GIACOBETTI** Telephone No. (02) 6283 2579

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
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Box No. I Basis of the report

1. With regard to the **language,** this report is based on:

[X] The international application in the language in which it was filed

[ ] A translation of the international application into , which is the language of a translation furnished for the purposes of:

[ ] international search (under Rules 12.3(a) and 23.1 (b))

[ ] publication of the international application (under Rule 12.4(a))

[ ] international preliminary examination (Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

[ ] the international application as originally filed/furnished

[X] the description:

pages **1, 3-9** as originally filed/furnished
pages* **2, 2A** received by this Authority on **25 November 2005** with the letter of **23 November 2005**
pages* received by this Authority on with the letter of

[X] the claims:

pages as originally filed/furnished
pages* as amended (together with any statement) under Article 19
pages* **10-12** received by this Authority on **25 November 2005** with the letter of **23 November 2005**
pages* received by this Authority on with the letter of

[X] the drawings:

pages **1/3-3/3** as originally filed/furnished
pages* received by this Authority on with the letter of
pages* received by this Authority on with the letter of

[ ] a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. [ ] The amendments have resulted in the cancellation of:

[ ] the description, pages
[ ] the claims, Nos.
[ ] the drawings, sheets/figs
[ ] the sequence listing *(specify)*:
[ ] any table(s) related to the sequence listing *(specify)*:

4. [ ] This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

[ ] the description, pages
[ ] the claims, Nos.
[ ] the drawings, sheets/figs
[ ] the sequence listing *(specify)*:
[ ] any table(s) related to the sequence listing *(specify)*:

* *If item 4 applies, some or all of those sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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Box No. V **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims **1-12**	**YES**
	Claims	**NO**
Inventive step (IS)	Claims **1-12**	**YES**
	Claims	**NO**
Industrial applicability (IA)	Claims **1-12**	**YES**
	Claims	**NO**

2. Citations and explanations (Rule 70.7)

Cited Prior Art Documents

D1: AU 77678/94 A (HAUS) 7 March 1996

D2: US 4477960 A (KNAPP) 23 October 1984

D3: US 5927610 A (DUTCHER) 27 July 1999

D4: DE 2839017 A1 (WAGNER & HALLENSLEBEN GMBH) 20 March 1980

D5: AU 56208/96 (684240) B (ZIERK) 4 December 1997

D6: AU 52154/79 A (HAMANN) 1 May 1980

D7: AU 33135/78 A (AQUAFEED INDUSTRIES PTY. LTD.) 16 August 1979

NOVELTY(N) and INVENTIVE STEP(IS): Claims 1-12 (YES)

The invention as defined in new claim 1 is a nutrient delivery device. None of the documents, taken individually or in obvious combination, disclose all the features of the device. In particular, none of the documents disclose or fairly teach a device with an elongate filter having a closed second end with a solid cap portion and the placement of the filter is such that the solid cap portion is disposed in a direct path of water flowing from an inlet end of a nutrient receiving chamber. Therefore the invention of claim 1, as well as appended claims 2 to 12, is novel and involves an inventive step over the above documents.

INDUSTRIAL APPLICABILITY(IA): Claims 1-12 (YES)

The invention as defined in claims 1 to 12 have industrial applicability because the nutrient delivery device can be made or used in industry.

CLAIMS

1. A nutrient delivery device, characterised by comprising:

- a nutrient receiving chamber for receiving a nutrient source, the nutrient receiving chamber having an inlet at a first end for receiving water from a water supply and an outlet at a second opposing end; and
- a filter, comprising an elongate tube member having perforations and being arranged within the nutrient receiving chamber such that the filter has a first open end adjacent the outlet end of the nutrient receiving chamber and a second end, having a cap portion with a solid surface, the cap portion being disposed in a direct path of water flowing from the inlet end into the nutrient receiving chamber;

wherein turbulence is created within the nutrient receiving chamber so as to at least partially dissolve the nutrient source and flows out of the outlet, and the filter prevents undissolved nutrient from flowing out of the outlet.

2. A nutrient delivery device according to claim 1, characterised in that the inlet end has a valve assembly attached thereto, the valve assembly being in fluid communication with the inlet and the nutrient receiving chamber.

3. A nutrient delivery device according to claim 2, characterised in that the valve assembly is a valve adapted to prevent backflow of water from the nutrient receiving chamber to the water supply.

4. A nutrient delivery device according to claim 2 or 3, characterised in that the valve assembly is a vacuum breaker valve.

5. A nutrient delivery device according to any one of claims 2 to 4, characterised in that the nutrient receiving chamber is a barrel portion, the barrel portion comprising an elongate conduit having the first open inlet end adjacent the valve assembly.

6. A nutrient delivery device according to any one of claims 1 to 5, characterised in that the cap portion is conical in configuration, whereby an apex of the cone points towards the first open end of the nutrient receiving chamber.

7. A nutrient delivery device according to any one of the preceding claims, characterised in that the surface area of the filter upon which the perforations are disposed is at least twenty times a surface area of a cross section of the second open outlet end of the nutrient receiving chamber.

8. A nutrient delivery device according to any one of the preceding claims, characterised in that nutrient receiving chamber is connected to the valve assembly by a socket.

9. A nutrient delivery device according to claim 8, characterised in that the socket has a diameter smaller relative to a diameter of the nutrient receiving chamber to assist in creation of turbulence in the water flowing from the water supply to the nutrient receiving chamber.

10. A nutrient delivery device in accordance with any one of the preceding claims, characterised by a sealing means adjacent the inlet end and outlet ends of the nutrient receiving chamber to enclose the nutrient source therein, the sealing means being permeable to water and dissolved nutrient.

11. A nutrient delivery device in accordance with claim 10, characterised in that the sealing means is a mesh disposed adjacent the first and second open ends of the nutrient receiving chamber.

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12. A nutrient delivery device in accordance with any one of the preceding claims, characterised in that the nutrient source is in the form of a plurality of prills.

SUMMARY OF THE INVENTION

In accordance with one aspect of the present invention there is provided a nutrient delivery device, characterised by comprising:

- a nutrient receiving chamber for receiving a nutrient source, the nutrient receiving chamber having an inlet at a first end for receiving water from a water supply and an outlet at a second opposing end; and
- a filter, comprising an elongate tube member having perforations and being arranged within the nutrient receiving chamber such that the filter has a first open end adjacent the outlet end of the nutrient receiving chamber and a second end, having a cap portion with a solid surface, the cap portion being disposed in a direct path of water flowing from the inlet end into the nutrient receiving chamber;

wherein turbulence is created within the nutrient receiving chamber so as to at least partially dissolve the nutrient source and flows out of the outlet, and the filter prevents undissolved nutrient from flowing out of the outlet.

DESCRIPTION OF THE DRAWINGS

The present invention will now be described, by way of example, with reference to the accompanying drawing, in which:

Figure 1 is a perspective view of a nutrient delivery device in accordance with the present invention;

Figure 2 is a perspective cross sectional view of the nutrient delivery device of Figure 1; and

Figure 3 is an exploded view of the nutrient delivery device of Figure 1.

DESCRIPTION OF AN EMBODIMENT OF THE INVENTION

Referring to the Figures, there is shown a nutrient delivery device 10 comprising a water inlet 12 with a valve assembly 14 attached thereto. The water inlet 12 and valve assembly 14 are each in fluid communication with a nutrient receiving chamber, which in the present embodiment is a barrel portion 16. The barrel portion 16 houses a filter 18. A suitable nutrient supply, such as prill controlled slow release fertiliser is deposited within the barrel portion 16 and about the filter 18.